

Claims

- [c1] 1. A reduced radius hem assembly comprising:
an inner panel having an outwardly extending perimeter flange comprising an end surface, an inboard surface, and a beveled surface located between the end surface and the inboard surface; and
an outer panel having a peripheral edge comprising a bend portion, an intermediate portion, and an end portion wherein the intermediate portion is adjacent to the beveled surface of the perimeter flange and the end portion overlies a portion of the inboard surface of the perimeter flange.
- [c2] 2. The reduced radius hem assembly of claim 1 wherein the thickness of the inner panel is greater than the thickness of the outer panel.
- [c3] 3. The reduced radius hem assembly of claim 1 wherein the inner panel comprises a magnesium composite material.
- [c4] 4. The reduced radius hem assembly of claim 1 wherein the perimeter flange of the inner panel is provided with the beveled surface that extends across a portion of the

perimeter flange.

- [c5] 5. The reduced radius hem assembly of claim 4 wherein the hem assembly includes areas that define cut lines and wherein the beveled surface is provided in the areas defining cut lines.
- [c6] 6. The reduced radius hem assembly of claim 4 wherein the hem assembly includes areas that define surface curvature and wherein the beveled surface is provided in the areas defining surface curvature.
- [c7] 7. A method of hemming an outer metal panel having a peripheral edge to an inner metal panel having a perimeter flange, the method comprising:
removing a top corner of the perimeter flange of the inner panel to form a beveled surface across a portion of the perimeter flange;
assembling the inner panel and the outer panel together;
forming the peripheral edge in a pre-hem pass with a hemming tool to bend the peripheral edge adjacent to the perimeter flange of the inner panel in a spaced relationship relative to the beveled surface; and
forming the peripheral edge of the outer panel into engagement with a portion of an inboard surface of the perimeter flange of the inner panel.

- [c8] 8. The method of claim 7, wherein the removing of a top corner of the perimeter flange of the inner panel comprises a deburring process.
- [c9] 9. A reduced radius hem for an inner and outer panel, the inner panel having an outwardly extending peripheral flange comprising an end surface, an inboard surface, and a beveled surface located between the end surface and the inboard surface, the outer panel having a peripheral edge comprising a bend portion, an intermediate portion, and an end portion whereby the beveled surface provides clearance for bending the peripheral edge of the outer panel over the inner panel.
- [c10] 10. The method of claim 7, wherein the removing of a top corner of the perimeter flange of the inner panel comprises a grinding process.
- [c11] 11. The method of claim 7, wherein the removing of a top corner of the perimeter flange of the inner panel to form a beveled surface across a portion of the perimeter flange is achieved by molding.
- [c12] 12. The method of claim 7, wherein the hemming tool is a roller.
- [c13] 13. A method of claim 7, wherein the beveled surface is oriented at approximately a 45° angle relative to the in-

board surface.

[c14] 14. A method of hemming an outer metal panel having a peripheral edge extending generally perpendicularly relative to the body of the outer panel and an inner metal panel having a perimeter flange together, the method comprising:

removing a top corner of the perimeter flange of the inner panel whereby a beveled surface is formed;

placing the inner panel and outer panel together;

rolling the peripheral edge in a first pre-hem pass to bend the peripheral edge to an acute angle relative to the body of the outer panel and spaced relative to the beveled surface;

rolling the peripheral edge in a second pre-hem pass to bend the peripheral edge to a second acute angle relative to the body of the outer panel; and

rolling the peripheral edge of the outer panel in a final pass over and into engagement with a perimeter flange of the inner panel.